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Claims

1. A method for determining an autofluorescence value of clinically healthy skin tissue (7) of a patient, comprising:

irradiating material of said tissue (7) with electromagnetic excitation radiation;

measuring an amount of electromagnetic, fluorescent radiation emitted by said material (7) in response to said irradiation; and

generating, in response to said measured amount of fluorescent radiation, a signal which represents a determined autofluorescence value for the respective patient;

characterized in that said skin tissue (7) is intact skin tissue (7) *in vivo* and that irradiation is performed noninvasively.

2. A method according to claim 1, wherein in response to at least one determined autofluorescence value an advanced glycation/glycosylation end product (AGE) content for said patient is determined and signaled.

3. A method according to claim 1 or 2, wherein a first skin surface is simultaneously irradiated, wherein fluorescent radiation which in response to said irradiation comes from different portions of a second skin surface (23) within said first skin surface is simultaneously received via a measuring window (18; 118) with a particular surface, and wherein said second skin surface is greater than the surface of said measuring window (18; 118).

4. A method according to claim 3, wherein said second skin surface is at least three times greater than the surface of said measuring window (18; 118).

5. A method according to any one of the preceding claims, wherein a first skin surface in its entirety is simultaneously irradiated, wherein fluorescent radiation which in response to said irradiation comes from different portions of a second skin surface (23) in its entirety is simultaneously received, and wherein the surface area of said second skin surface (23) is at least 0.1 cm^2.

6. A method according to any one of the preceding claims, wherein said fluorescent radiation is received via a measuring window (18) and wherein said measuring window (18) is held at an angle of 25-65° and preferably of about 45° relative to the irradiated surface of the skin (7).

7. A method according to any one of the preceding claims, wherein said fluorescent radiation is received via a measuring window (18) and wherein said measuring window (18; 118) is held at a distance from the skin (7).

8. A method according to any one of the preceding claims, wherein the irradiation with electromagnetic excitation radiation in a first wavelength range and the measurement of emitted electromagnetic fluorescent radiation in a second wavelength range outside said first wavelength range takes place simultaneously with the irradiation, while all wavelengths of said first wavelength range are smaller than all wavelengths of said second wavelength range, and said first wavelength range comprises a wavelength in a range of 300-420 nm, and said second wavelength range comprises a longer wavelength in a range of ≤600 nm.

9. A method according to any one of the preceding claims, further comprising determining an aggregated amount of detected electromagnetic radiation over a particular wavelength range, while determining said autofluorescence value occurs in response to said aggregated amount of detected electromagnetic radiation.

10. A method according to any one of the preceding claims, further comprising: passing radiation coming from said skin tissue (7) to a spectrometer (15), dividing received radiation within a measuring range of wavelengths into fractions per wavelength sub-range, and aggregating detected fractions of fluorescent radiation to an aggregated amount of detected electromagnetic radiation, while determining said autofluorescence value occurs in response to said aggregated amount of detected electromagnetic radiation.

11. A method according to any one of the preceding claims, further comprising detecting reflected excitation radiation, while generating said autofluorescence value occurs partly in response to a detected amount of said electromagnetic excitation radiation.

12. A method according to claim 11, wherein reflected excitation radiation is detected by a first detector (120) and wherein said fluorescent radiation is detected by another, separate detector (122).

13. A method according to any one of the preceding claims, wherein said fluorescent radiation coming from at least a portion of said irradiated skin surface is detected after the irradiation of said at least one portion of said skin surface has been changed.

14. A method according to claim 13, wherein said fluorescent radiation is detected in at least one wavelength corresponding with at least one wavelength of said excitation radiation.

15. A method according to claim 13 or 14, wherein said excitation radiation is emitted in a pulsating or modulated fashion.

16. A method according to any one of the preceding claims, further comprising performing a reference measurement on a reference material, while generating said signal occurs partly in response to at least one amount of electromagnetic radiation detected in said reference measurement.

17. An apparatus for determining an autofluorescence value of clinically healthy skin tissue (7) of a patient, comprising:

a pick-up unit with a radiation source (2; 102), for *in vivo* and noninvasively irradiating intact skin tissue (7) behind a particular irradiation window (8; 108) with electromagnetic excitation radiation;

a detector (22; 122) for measuring electromagnetic fluorescent radiation coming from said skin tissue (7); and

means (17) for generating an autofluorescence value for said skin tissue (7) in agreement with said measured amount of fluorescent radiation originating from said skin tissue (7).

18. An apparatus according to claim 17, further comprising means (16, 17) for determining and signaling in response to at least one determined autofluorescence value an advanced glycation/glycosylation end product (AGE) content for said patient.

19.An apparatus according to claim 17 or 18, further comprising an irradiation window (8; 108) for determining a first surface of said skin tissue to be irradiated, and a measuring window (18; 118) with a particular surface for passing fluorescent radiation to be detected coming from a second surface within said first surface, said second surface being greater than the surface of said measuring window (18; 118).

20. An apparatus according to claim 19, wherein said second surface is at least three times greater than the surface of said measuring window (18; 118).

21. An apparatus according to any one of claims 17-20, further comprising a supporting structure (6) to be held against a skin (7) of a patient, for defining a plane in which a surface of said skin tissue to be irradiated is located, and a measuring window (18) for passing light to be detected coming from said irradiated skin tissue (7), said measuring window (18) being oriented

at an angle of 25-65°, preferably at an angle of about 45° relative to said surface.

22. An apparatus according to claim 21, wherein said supporting structure (6) comprises an irradiation window (8) for delimiting a surface of said skin tissue (7) to be irradiated, said measuring window (18) being located adjacent an edge (19) of said irradiation window (8).

23. An apparatus according to any one of claims 17-22, further comprising a supporting structure (6; 106) to be held against a skin (7) of a patient for defining a plane in which a surface of said skin tissue to be irradiated is located, and a measuring window (18; 118) for passing light to be detected coming from said irradiated skin tissue (7), said measuring window (18; 118) being spaced away from the passage surface of said surface.

24. An apparatus according to any one of claims 17-23, further comprising a supporting structure to be held against a skin (7) of a patient for defining a plane in which a surface of said skin tissue to be irradiated is located, and a measuring window (18) for passing light to be detected coming from said irradiated skin tissue (7), the position of the measuring window (18) relative to said surface being adjustable for adjusting the distance between said measuring window (18) and said irradiation window (8).

25. An apparatus according to any one of claims 17-24, further comprising a supporting structure to be held against a skin (7) of a patient for defining a plane in which a surface of said skin tissue to be irradiated is located, and a measuring window (18) for passing light to be detected coming from said irradiated skin tissue (7), and an optical filter between said radiation source (2) and said irradiation window (8).

26. An apparatus according to any one of claims 17-25, wherein said radiation source (2) is an electrofluorescent lamp for emitting radiation in a wavelength range of 300-420 nm.

27. An apparatus according to any one of claims 17-25, wherein said radiation source (102; 202) is a light-emitting diode or laser diode for emitting radiation having at least one wavelength in a wavelength range of 300-420 nm, and preferably for emitting radiation having a wavelength of 370 nm.

28. An apparatus according to any one of claims 17-27, further comprising a measuring window (18) for passing light to be detected coming from said irradiated portion of said skin tissue (7), and a spectrometer

connect d with said measuring window (18) for receiving radiation passing through said measuring window (18).

29. An apparatus according to any one of claims 17-28, further comprising separate detectors (122, 120) for detecting reflected excitation radiation and fluorescent radiation.

30. An apparatus according to any one of claims 17-29, arranged for irradiating said skin tissue during at least a first period and for detecting fluorescent radiation during a second period following said first period, and further comprising control means for changing the excitation radiation such that it is different in said second period than in said first period.

31. An apparatus according to claim 30, adapted for intermittently irradiating said skin tissue (7) and for separately detecting radiation coming from said skin tissue (7) in periods alternating with said intermittent irradiation.